BOTANICA

THE BEGONIACEAE OF COLOMBIA (*)

By LYMAN B. SMITH and BERNICE G. SCHUBERT
Gray Herbarium of Harvard University, Cambridge, Massachusetts.

49. **Begonia** (§ **Ruizopavonia**) **Dugandiana** Smith & Schubert, spec. nov., herba, ad 7 dm. alta (! *Killip & Varela*), caule ramoso, lineato, glabro, stipulis ellipticis, integris, acutis, plus minusve pubescentibus, ad 8 mm. longis, mox deciduis, hamulis axillaribus spinis similibus saepe prominentibus; petiolis hirsutis, ad 1.5 cm. longis; laminis oblique ellipticis, acuminatis, basi oblique truncatis vel leviter cordatis, 8-10 cm. longis, 3.5-6 cm. latis; supra glabris, subtus hirsutis, remote serratis; pedunculis axillaribus lineatis hirsutisque, inflorescentiis cymosis, multifloris; pedicellis tenuibus, hirsutis; bracteis deciduis; pedicellis masculinis 5-6 mm. longis, tepalis 4, albis, exterioribus orbicularibus vel obovatis, ad 5.5 mm. longis, 5 mm. latis, interioribus ellipticis, ad 3.5 mm. longis, 1.5 mm. latis, staminibus ca. 20, liberis, antheris oblongis, obtusis, connectivo producto; floribus femineis bracteolatis, cum pedicellis fructiferis ad 20 mm. longis, bracteolis longe persistentibus, orbicularibus, serrulato-ciliatis, saepe retusis, ad 5.5 mm. diametro, basi cordatis; tepalis stylisque non visis; placentis bifidis undique ovuliferis; capsulis trilocularibus, ca. 5 mm. altis, alis inaequalibus, ala maxima adscendente dolabriforme, 10-15 mm. alta, 8-10 mm. lata, obtusa, duobus ceteris marginiformibus; seminibus obtusis, striatis. Tab. 14.

TOLIMA: along Quindío Highway, between Cajamarca and summit of Divide, alt. 2400 m., Mar. 27, 28, 1939, *Killip & Varela 34536* (US, **type**; G, **isotype**).

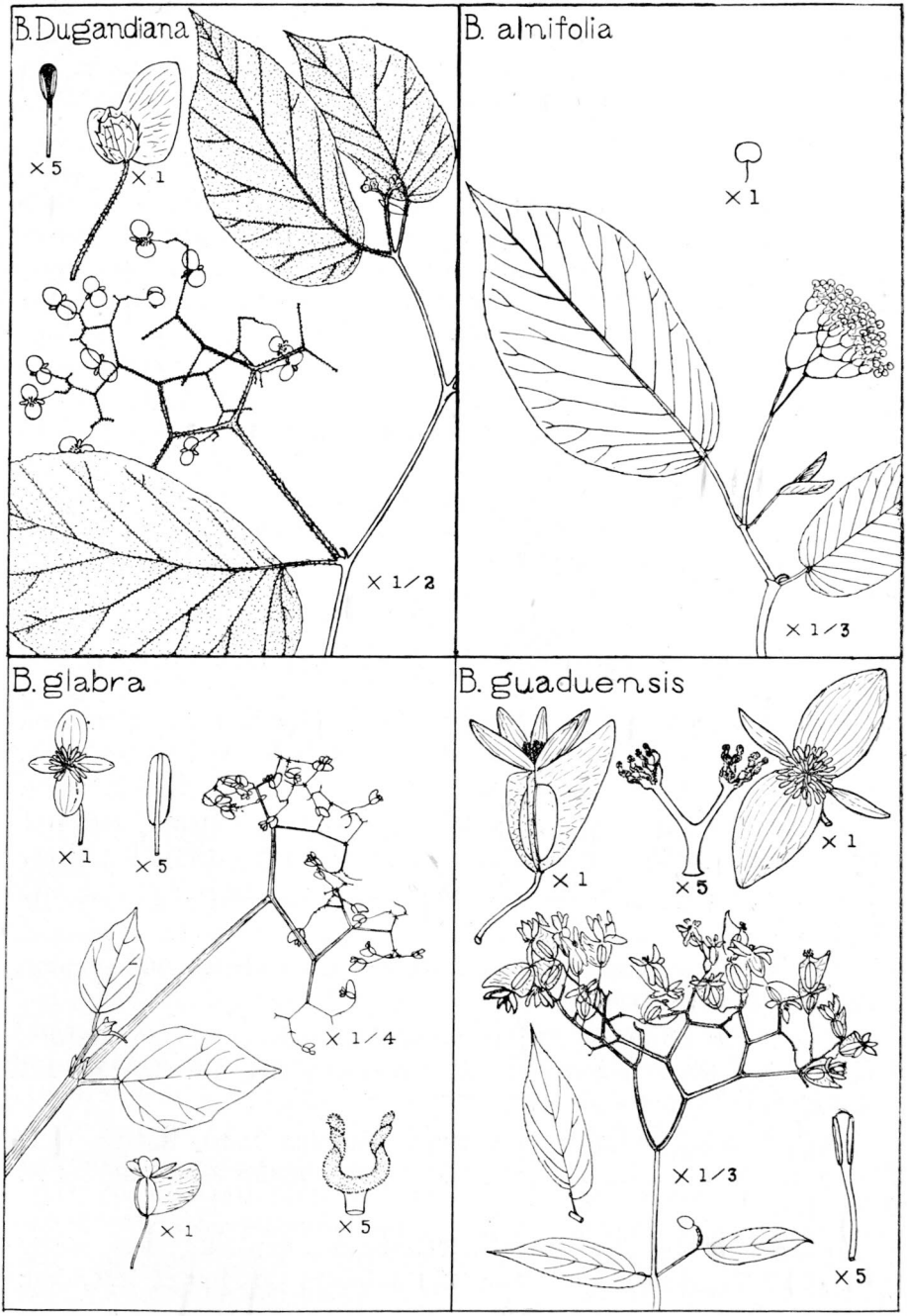
(*) Continued from page 107.

B. Dugandiana belongs to that group of species in section *Ruizopavonia* whose members possess conspicuous and usually persistent bracteoles. Although its general aspect is that of *B. alnifolia,* its relationship is with the group of species having four staminate tepals (the pistillate are presumably three). From *B. Cuatrecasana, B. Dugandiana* differs in having more oblique leaves and smaller flowers with orbicular outer tepals; from *B. cymbalifera* it differs in having its capsule-wings only remotely and minutely, if at all, ciliate; from *B. consobrina* (of Ecuador) in its penninerved leaves and pubescent lower leaf-surfaces. From all three species *B. Dugandiana* is distinct in having its largest capsule-wing exceeding the body of the capsule both above and below.

It is very pleasant indeed, to name this species for Dr. Armando Dugand, Director of the Instituto de Ciencias Naturales, Bogotá, Colombia, and editor of CALDASIA, who has shown great interest in our studies and whose coöperation has been most helpful in their prosecution.

50. **Begonia (§ Ruizopavonia) alnifolia** A. DC. Scandent to erect, essentially glabrous shrub; stem usually not more than 5 mm. thick, ribbed, internodes of main axis 5.5-14 cm. long; leaves unequally elliptic-obovate, 11-15 cm. long, 4-8 cm. broad, the obtuse subcordate base usually with broader half only slightly produced on the petiole, the broad apex abruptly narrowed into a short acumination, surfaces smooth or foveolate, margin denticulate-setiferous; petioles very short; stipules caducous, oblong, obtuse, 14-16 mm. long; inflorescence cymose, cymes chiefly axillary, exceeded by the leaves; bracts caducous, obtuse, entire, 2-3 mm. long; staminate pedicels slender, ca. 7 mm. long, staminate tepals 2, orbicular, 4 mm. broad; anthers oblong, exceeding the filaments in length, connective produced beyond the loculi, ovate-acute; pistillate bracteoles appressed to the ovary, ovate, dentate, 2-2.5 mm. long, tepals 2, orbicular; ovary glabrous, with bifid styles, the branches divided and spiraling, 4-winged, 1 wing larger.—Endemic.—A. DC. in Ann. Sci. Nat. sér. 4, xi. 133 (1859); in DC. Prod. xv. pt. 1, 331 (1864). Tab. 14.

NORTE DE SANTANDER: Ocaña, *Schlim 561* (Gen, **type**; Kew, **isotype**; G, photos (of type, CM neg. no. 24177; of isotype, Killip neg. no. 502)).


B. Dugandiana
× 5
× 1
× 1/2
B. almifolia
× 1
× 1/3
B. glabra
× 1
× 5
× 1/4
× 1
× 5
B. guaduensis
× 1
× 5
× 1
× 1/3
× 5

TAB. 14

Begonia alnifolia is known to us only from photographs of the type- and isotype-material, which is staminate. The description of the pistillate flowers is taken from DeCandolle's diagnosis in the Prodromus.

51. **Begonia (§ Pritzelia) glabra** Aubl. Succulent herb to 8 m. high (*! Haught*); stem scandent, rooting at the nodes, glabrous; leaves nearly symmetrical, broadly ovate, 4-15 cm. long, short-acuminate, rounded or barely cordate at base, sparsely serrate and ciliate to entire, often undulate, glabrous, petioles 1-8 cm. long, stipules persistent, ovate-oblong, mucronate, entire, 10-24 mm. long, membranaceous, red-brown; peduncles axillary, 6-20 cm. long; cymes many-flowered, diffuse; bracts persistent, minute; pedicels slender, 6-16 mm. long; staminate tepals 4, white, the outer broadly obovate, 3-8 mm. long, the inner narrowly elliptic; stamens free, few, anthers oblong; pistillate tepals 5, 4-6 mm. long; styles 3, 2-parted, completely covered by stigmatic papillae, placentae simple; capsule 6-9 mm. long, largest wing oblong to triangular, 10-14 mm. wide, the other two marginiform, very narrow.—Southern Mexico and the West Indies to Guiana, Bolivia and Perú.—Aubl. Pl. Guian. ii. 916, t. 349 (1775). *B. scandens* Sw. Prod. 86 (1788); Irmscher in Engl. & Prantl. Nat. Pflanzenfam. ed. 2, xxi. 582 (1925). *B. elliptica* HBK. Nov. Gen. & Sp. vii. 180, t. 641 (1825). *B. lucida* Otto & Dietr. in Allg. Gartenz. xvi. 162 (1848). *B. Moritziana* Kunth & Bouché in Ind. Sem. Hort. Berol. 16 (1848). *B. physalifolia* Liebm. in Kjoeb. Vidensk. Meddell. 1852. 19 (1853). *Wageneria deflexa* Kl. Begon. 113 (1855). *W. lucida* Kl. op. cit. 114. *W. montana* Kl. op. cit. 115. *W. glabra* Kl. loc. cit. Tab. 14.

MAGDALENA: along stream, above Manaure, alt. ca. 700 m., Jan. 1-23, 1944, *Haught 3984* (G).

NORTE DE SANTANDER: Cordillera Oriental, región of Sarare, mouth of Río Margua between Junín and Córdoba, alt. 920-1240 m., Nov. 22, 1941, *Cuatrecasas 13379* (US).

CHOCO: edge of forest along Quebrada Jella, Bahía Solano, near Ciudad Mutis, alt. 0-75 m., Feb. 21-23, 1939, *Killip & H. García B. 33595* (G).

VALLE: forest, Cisneros, alt. 300-500 m., Sept. 21, 1922, *Killip 11456* (G, NY); woods, west slope of Cordillera Occidental, left bank

of mouth of Río Digua, Piedra de Moler, alt. 900-1180 m., Aug. 19-28, 1943, *Cuatrecasas 15084* (G).

PUTUMAYO: forest, Umbría, alt. 325 m., Oct.-Nov., 1930, *Klug 1661* (G, NY, US); moist thicket by Río San Miguel, Quebrada de la Hormiga, alt. 290 m., Dec. 17, 1940, *Cuatrecasas 11129* (US).

Var. **amplifolia** (A. DC.) Smith & Schubert. Leaves up to 20 cm. long and 15 cm. wide, undulate to entire; largest wing of the ovary often ascending.—Endemic.—Smith & Schubert in Bot. Ser. Field Mus. xiii. 191 (1941). *B. scandens β amplifolia* A. DC. in DC. Prod. xv. pt. 1, 362 (1864).

MAGDALENA: occasional in damp forest, near Don Amo Viejo, Santa Marta, alt. 600 m., Jan. 14, 1899, *H. H. Smith 1267* (G, Mo, NY, US).

CAUCA: forest, "La Gallera", Micay Valley, alt. 1400-1500 m., June 29-30, 1922, *Killip 7722* (G, NY, US); same, alt. 1800-1900 m., July 1, 1922, *Killip 7916* (G, NY, US).

Begonia glabra, a common species throughout its range, is easily recognizable by its almost symmetrical leaves. In works of older authors the species was most frequently called *B. scandens.*

There are many transitions between the typical variety and var. *amplifolia,* but the extremes are sufficiently marked to warrant maintaining the latter entity.

52. **Begonia (§ Begoniastrum) guaduensis** HBK. Suffruticose, scandent to 2 m. high (! *Cuatrecasas*), glabrous; stem erect, branched; leaves straight, asymmetric, pinnate-nerved, lanceolate to elliptic-lanceolate, acute or acuminate, unequal at base with the adaxial side cuneate and the other rounded and decurrent, 5-9 cm. long, 16-40 mm. wide, doubly crenate-serrate, ciliate, membranaceous, glabrous, petiole 2-8 mm. long, stipules deciduous or subpersistent, oblong-ovate, acuminate-setiferous, 8-10 mm. long, scarious, glabrous; peduncles terminal and axillary, 4-5 cm. long; cymes dichotomous, few-many-flowered, 6-15 cm. in diameter, glabrous; bracts deciduous or subpersistent, ovate, obtuse, acute or mucronate, 4-7 mm. long, scarious; pedicels 4-19 mm. long; flowers pinkinsh white; staminate tepals 4, the outer elliptic-ovate, entire or dentate at apex, 8-15 mm. long, the inner obovate, distinctly shorter; stamens free, very numerous, anthers oblong, mostly shorter than the filaments, connective

produced, apiculate or obtuse; pistillate bracteoles deciduous, ovate to narrowly obovate, 6 mm. long, entire; pistillate tepals 5, subequal, with the two outer slightly smaller, elliptic, acute, 6-10 mm. long; styles 3, bifid nearly to base, each main branch with 3-4 short spiral branches; placentae bifid, ovuliferous throughout; capsule ellipsoid, the largest wing triangular, horizontal or slightly ascending, 15 mm. wide, the other two marginiform.—Panama; Venezuela.—HBK. Nov. Gen. & Sp. vii. 178 (1825). Irmscher in Engl. & Prantl, Nat. Pflanzenfam. ed. 2, xxi. 582 (1925). *B. Ottonis* Walpers, Repert. Bot. Syst. ii. 212 (1843). *B. Walpersii* Heynh. Nom. ii. 63 (1846)). *Donaldia Ottonis* Kl. in Monatsb. Berlin Akad. 127 (1854); idem, Begon. 79 (1855). *B. laurina* Hort. ex A. DC. in DC. Prod. xv. pt. 1, 292 (1864), nomen in synon. *B. serratifolia* C. DC. in Smithsonian Misc. Coll. lxix. no. 12, 7 (1919). Tab. 14.

MAGDALENA: saxicolous or terrestrial in damp forest, Agua Dulce Road, Santa Marta, alt. 360 m., Jan., 1899, *H. H. Smith 1263* (G, NY); on sandstone cliffs in forest about 7 km. east of Codazzi, alt. ca. 300 m., Oct. 21, 1943, *Haught 3767* (G).

NORTE DE SANTANDER: Cordillera Oriental, region of Sarare, Quebrada de la China (tributary of Río Cubugón), between Santa Librada and El Caraño, alt. 600-830 m., Nov. 11, 1941, *Cuatrecasas 12983, 12988* (US); Cordillera Oriental, region of Sarare, basin of Río Margua between Campohermoso and Río Negro, alt. 1200-1500 m., Nov. 8, 1941, *Cuatrecasas 12901* (US); Cordillera Oriental, region of Sarare, mouth of Río Chitagá between Chorro Colorado and Bata, alt. 1300 m., Oct. 14-17, 1941, *Cuatrecasas, Schultes & E. Smith 12231* (US).

ANTIOQUIA: near Samaná, Jan. 4, 1946, *L. Uribe 1145* (Col).

CUNDINAMARCA: "prope Guaduas, inter Honda et Santa Fe de Bogotá, alt. 590 hex.", *Humboldt & Bonpland* (Paris, **type**, not seen; CM, fragment); (mixed with *Impatiens*), thickets and coffee groves, vicinity of San Bernardo to Sasaima, alt. 1600-1800 m., June 23, 1940, *Cuatrecasas 9619a* (G, US); Estación San Bernardo, between Sasaima and Albán, alt. 1700-1800 m., Aug. 2-5, 1945, *Dugand & Jaramillo 3945* (US).

META: Los Llanos, Villavicencio toward El Parrao, alt. 500 m., Oct. 10, 1938, *Cuatrecasas 4643* (US).

VAUPES: thicket, Río Guayabero, alt. 240 m., Nov. 8, 1939, *Cuatrecasas 7545* (US).

The following appears to be a large-flowered form:

BOYACA: forest fronts, region of M. Chapón, 100 miles nw. of Bogotá, alt. 900 m., Aug. 6, 1932, *Lawrance 391* (G, Mo, NY).

The material of this species from Panama was named *B. serratifolia,* but we have not been able to discover any significant characters by which to distinguish it from the South American collections.

Var. **Andreana** (Sprague) Smith & Schubert, comb. nov. Leaves acute; stamen-connectives apiculate; largest capsule-wing obtuse and horizontal.—Endemic.—*B. Andreana* Sprague in Trans. Proc. Bot. Soc. Edinb. xxii. 433 (1905).

META: Villavicencio, 1898-99, *Sprague 133* (US, **isotype**); common on road to Villavicencio, alt. ± 800 m., Dec. 12, 1938, *Haught 2453* (G).

Study of isotypic material of *B. Andreana* from the United States National Herbarium shows its very close affinity to *B. guaduensis.* The chief differences are noted in our diagnosis. One fragmentary specimen, *Cuatrecasas 9619a,* has the leaves of var. *Andreana* and the fruit of the typical variety (so far as we can tell from its immature condition); *Haught 2453* agrees very well with Sprague's isotype.

53. **Begonia** (§ **Begoniastrum) Barrigae** Smith & Schubert, spec. nov., suffruticosa, verisimiliter grandis, ramosa; ramis juvenilibus puberulis; foliis rectis, asymmetricis, lanceolatis, acuminatis, basi valde dimidiatis, 4-5 cm. longis, ad 2 cm. latis, serratis ciliatisque, supra glabris, subtus ad nervos puberulis petiolis 4-6 mm. longis, puberulis, stipulis persistentibus, ovatis, acuminatis, 8 mm. longis, integris; pedunculis verisimiliter terminalibus, 4 cm. longis, puberulis; inflorescentia corymbosa, multiflora, ca. 16 cm. diametro, glabra; bracteis persistentibus, lanceolatis, acuminatis, 3 mm. longis, serrulatis, hyalinis; pedicellis gracillimis, ad 12 mm. longis; tepalis masculinis 4, exterioribus suborbicularibus, 5 mm. longis, apice serrulatis, interioribus ellipticis, parvis; staminibus multis, antheris suborbicularibus quam filamentis multo brevioribus, connectivo producto obtuso; bracteolis femineis parvis, bracteis similibus; tepalis femineis 5, paulo inaequalibus, ovatis, ad 7 mm. longis, serrulato-ciliatis; stylis 3, bifidis, stigmatibus linearibus, spiraliter tortis, placentis bilamellatis, undique ovuliferis; capsula ellipsoidea, inaequaliter alata, alis triangulo-ovatis. Tab. 15.

CUNDINAMARCA: Nocaima, Hacienda Tobia, alt. 850 m., Jan. 15-20, 1942, *H. García-Barriga 10577* (US, **type**); grassy bank, "Guayabetal", southeast of Quetame, alt. 1300-1500 m., Sept. 5, 1917, *Pennell 1749* (NY).

From *B. guaduensis*, *B. Barrigae* may be distinguished by its much smaller staminate flowers with suborbicular rather than elliptic-ovate outer tepals and suborbicular rather than oblong anthers; by its serrulate-ciliate pistillate tepals and by its much narrower capsule-wings. From *B. Holtonis*, *B. Barrigae* also differs in the shape of the outer staminate tepals, and in the pistillate tepals which in *B. Holtonis* are narrowly obovate and entire.

54. **Begonia** (§ **Meionanthera**) **Holtonis** A. DC. Fruticose or herbaceous, 12-15 dm. high, glabrous; leaves straight, slightly asymmetric, penninerved, elliptic, abruptly acuminate, dimidiate at base, 4-6.5 cm. long, 2.5-4.5 cm. wide, crenate-serrate, ciliate, petiole 2-6 mm. long, stipules deciduous, linear-lanceolate, acuminate; peduncles axillary, 3.5-8 cm. long; cymes dichotomous, many-flowered, 7-30 cm. in diameter; bracts deciduous, elliptic to narrowly ovate, obtuse to acuminate, setiferous, over 4 mm. long; pedicels filiform, the pistillate to 15 mm. long, the staminate much shorter; staminate tepals 2 or 4, the outer broadly ovate, 3-6 mm. long, white, the inner narrowly obovate, obtuse; stamens on a low torus, numerous, anthers subglobose, much shorter than the filaments, connective not produced; pistillate bracteoles deciduous, 4 mm. long; pistillate tepals 5, narrowly obovate, 5-8 mm. long, white; styles 3, bifid, branches spiral, covered with stigmatic papillae, placentae simple to bilamellate (intermediate in the type), ovuliferous throughout; capsule ellipsoid, very unequally 3-winged, the largest wing triangular-ovate, 1 cm. wide, the other 2 narrowly marginiform.—Endemic.—A. DC. in Ann. Sci. Nat. sér. 4, xi. 141 (1859). Irmscher in Engl. & Prantl. Nat. Pflanzenfam. ed. 2, xxi. 582 (1925). ? *B. umbrata* A. DC. in DC. Prod. xv. pt. 1, 396 (1864). Tab. 15.

BOLIVAR: forest, Cascada Chorrón, south of Antizales, alt. 1500-1800 m., Feb. 25, 1918, *Pennell 4427* (NY).

ANTIOQUIA: San Antonio de Pereira, Dec. 1937, *Daniel 1374* (CM); Monte San Félix, Sept. 1940, *Daniel 2326* (US).

CUNDINAMARCA: woods, Icononzo, alt. 1400-1800 m., Dec. 1-4, 1917, *Pennell 2865* (NY).

TOLIMA: Prov. de Mariquita: Azufral del Quindío, alt. 2000 m., Jan. 1853, *Triana (8)* (Col); forest, "La Virginia", Líbano, alt. 1200-1500 m., Dec. 22, 1917, *Pennell 3284* (G, NY, US); Cordillera Central: forest, "Buenavista" to "Azufral", old Quindío trail, alt. 1800-2300 m., Aug. 3, 1922, *Killip & Hazen 9599* (G, NY); Río Coello, new Quindío trail, alt. 1000-1500 m., Aug. 7, 1922, *Hazen 9648* (NY); Ibagué, alt. ca. 1100 m., July 7, 1939, *Pérez & Cuatrecasas 5732* (US).

CALDAS: Cordillera Central: moist soil near river, Río Quindío, above Armenia, alt. 1300-1500 m., July 25, 1922, *Pennell, Killip & Hazen 8718* (NY); edge of forest, Río Santa Rita, Salento, alt. 1600-1800 m., July 29, 1922, *Killip & Hazen 8972* (G, NY, US).

HUILA: forest, Cordillera Oriental, east of Neiva, alt. 1800-2300 m., Aug. 1-8, 1917, *Rusby & Pennell 576* (G, Mo, NY, US), *872* and *873* (NY).

VALLE: Cordillera Occidental: edge of forest, La Cumbre, alt. 1800-2100 m., May 21-25, 1922, *Pennel & Killip 5883* (G, NY); Dagua, "Queremal", Jan. 20, 1935, *E. Pérez-Arbeláez 3095* (Col, US); woods, Cordillera Occidental, western slope, basin or Río Sanquininí, left bank, La Laguna, alt. 1250-1400 m., Dec. 10-20, 1943, *Cuatrecasas 15694* (G).

BOYACA: in shade, side of precipice facing south, region of Mt. Chapón, extreme western Boyacá, alt. 1020 m., June 14, 1932, *Lawrance 221* (G, Mo, NY).

DEPARTMENT UNKNOWN: Colombia, without further locality, *Holton 725* (Gen. **type**; G. **isotype**).

The small orbicular anthers, long slender filaments and elongate pistillate tepals serve to make *B. Holtonis* easily recognizable from its relatives.

Var. **macrophylla** Smith & Schubert var. nov., foliis ad 11 cm. longis et 5 cm. latis; bracteis amplis, floribus juvenilibus omnino occultantibus.

CAUCA: Cordillera Occidental: woodland, Río Ortega to "El Ramal", alt. 1900-2200 m., July 2, 1922, *Pennell & Killip 8073* (NY, **type**).

The following specimen is probably best cited here too:

CAUCA: around Tacueyó, Río Palo Valley, Huila group, central Cordillera, alt. 1800 m., Jan. 1906, *H. Pittier 1029* (US).

This variety may be separated from the typical by its larger leaves and broader, persistent bracts.

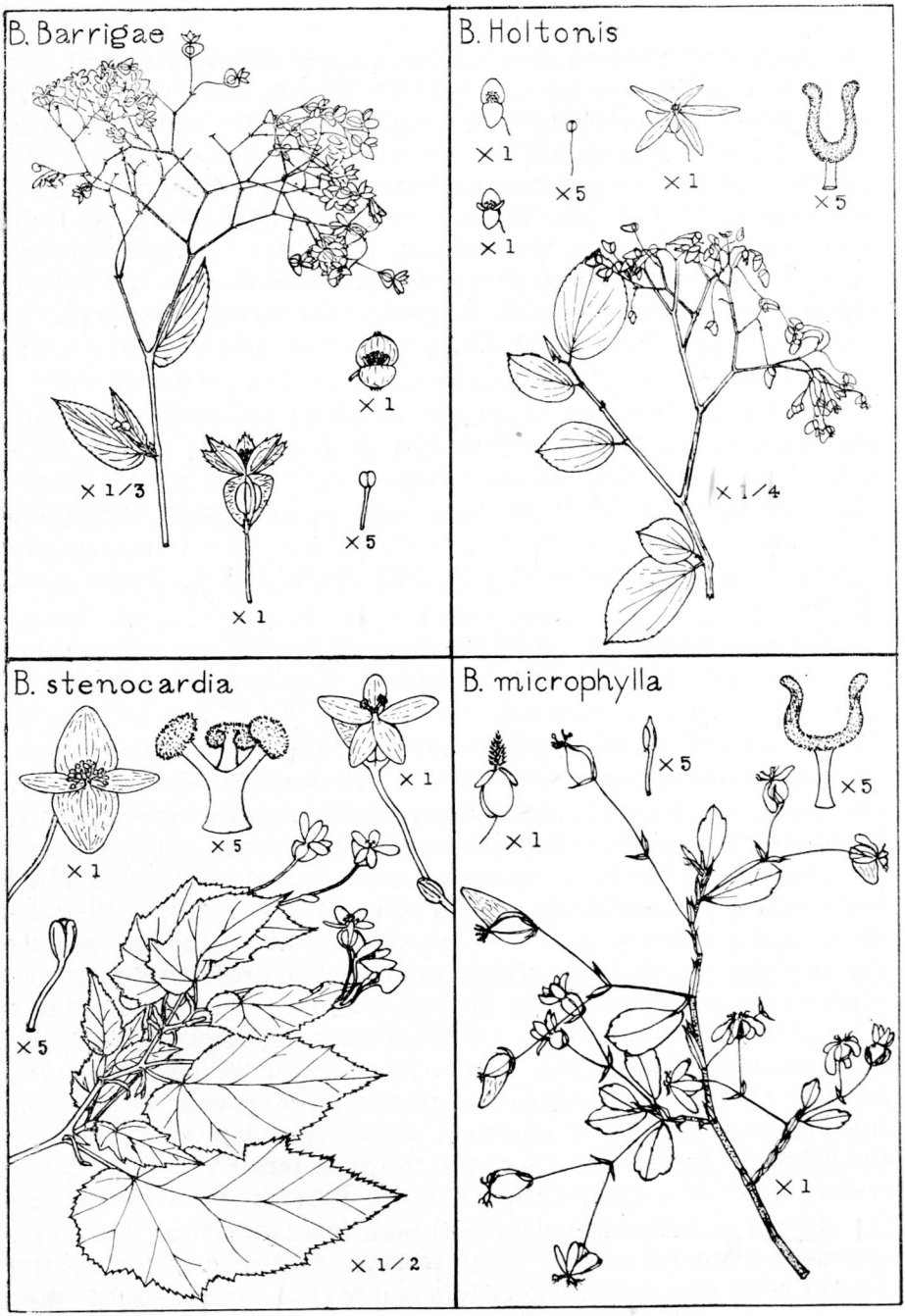
55. **Begonia (? §) stenocardia** Smith & Schubert spec. nov., e fragmento solum cognita, verisimiliter herbacea et perennis, glabra; ramis gracilibus, geniculatis; foliis rectis vel subrectis, valde asymmetricis, anguste ovatis, acutis, basi valde inaequaliter cordatis, ad 8.5 cm. longis et 4.3 cm. latis, sublobatis, serratis, ciliatis, petiolis ad 2 cm. longis, stipulis persistentibus, oblongis, setoso-apiculatis, integris, 11 mm. longis, tenuibus, brunneis; pedunculis axillaribus, gracillimis, 2-3 cm. longis; inflorescentia laxe pauciflora, bracteis deciduis, ellipticis, integris, 4 mm. longis; pedicellis 8-16 mm. longis; tepalis masculinis 4, integris, roseis, exterioribus late ovatis, 10 mm. longis, interioribus oblongis, haud brevioribus; staminibus multis, in columnam insertis, antheris ellipsoideis, quam filamentis brevioribus; bracteolis femineis nullis; tepalis femineis 5, ellipticis, subaequalibus, integris; stylis 3, basi connatis, apice lunulato-bilobis; ovario late ellipsoideo, placentis bilamellatis (?); capsula perjuvenili solum cognita, inaequaliter trialata, ala maxima subtriangulari. Tab. 15.

CHOCO: Truandó Falls, (Atrato River), Jan. 1858, *Schott 1* (CM, **type**).

Begonia stenocardia differs from *B. Holtonis*, in addition to having persistent rather than deciduous bracts and stipules, by its much larger staminate tepals and anthers, its broader pistillate tepals and its styles which are bilobate only at the apex.

From *B. microphylla*, *B. stenocardia* is differentiated by its smooth branches, its short stamen-column and its barely produced anther-connective as well as by its styles.

56. **Begonia (§ Lepsia) microphylla** A. DC. Fruticose, 1-3 m. high, much branched; the ultimate branches densely papillose, densely and persistently foliate; leaves straight, slightly asymmetric, obovate-oblong, broadly acute or obtuse, dimidiate at base, 8-10 (rarely to 15) mm. long, coarsely crenate-serrate, ciliate, dark green above, finely white-spotted beneath, petiole very short, stipules persistent, lanceolate, setiferous-acuminate, 4-6 mm. long, 1-nerved, membranaceous, brown; peduncles axillary, 6-10 mm. long, almost capillary; staminate inflorescences 2-7-flowered, the pistillate 2-flowered; bracts persistent, ovate, like the stipules but shorter; pedicels capillary, 4-10 mm. long; flowers white; staminate tepals 4, the outer ovate or elliptic, obtuse, 3-5 mm. long, the inner oblong, shorter; stamens on an elongate column, anthers ellipsoid, connective well produced, acute; pistil-


B. Barrigae
× 1/3
× 1
× 1
× 5
B. Holtonis
× 1
× 5
× 1
× 1
× 5
× 1/4
B. stenocardia
× 1
× 5
× 1
× 5
× 1/2
B. microphylla
× 1
× 5
× 5
× 1

TAB. 15

late bracteoles like the bracts, nearly equaling the ovary at anthesis; pistillate tepals 5, 5-6 mm. long; styles 3 or 4, bifid, the stigmatic tissue linear, spiral, continuous; placentae simple; capsule broadly ovoid, 4-6 mm. long excluding the wings, unequally 3-winged, the largest wing ovate or lunate, 4-8 mm. wide, the other 2 marginiform.—Venezuela.—A. DC. in DC. Prod. xv. pt. 1, 375 (1864), non Willd. ex Kl. in Monatsb. Berlin Akad. 123 (1854), nomen in synom., Irmscher in Engl. & Prantl. Nat. Pflanzenfam. ed. 2, xxi. 581 (1925). *Lepsia microphylla* Kl. Begon. 62 (1855), non *L. microphylla* Kl. in Monatsb. Berlin Akad. 123 (1854). *L. foliosa* Kl. Begon. (1855) quoad synon. p. 62 et t. 5, fig. A.—Tab. 15.

SANTANDER: edge of forest, Río Suratá valley, above Suratá, alt. 2000-2300 m., Jan. 5-6, 1927, *Killip & A. C. Smith 16702* (G, NY, US); same, dense forest, Jan. 5-6, 1927, *Killip & A. C. Smith 21159* (G, US); dense forest, vicinity of La Baja, alt. 3000 m., Jan. 14-31, 1927, *Killip & A. C. Smith 18339* (G, NY, US), *18355* (G, NY, US); forest, vicinity of Charta, alt. 2600 m., Feb., 1-11, 1927, *Killip & A. C. Smith 18843* (G, NY, US).

Begonia microphylla is easily recognizable even in sterile condition by its densely papillose branches.

57. **Begonia (§ Lepsia) foliosa** HBK. Fruticose, 1-2.5 m. high, much branched, glabrous; the ultimate branches smooth; leaves tardily deciduous, straight, slightly asymmetric, obovate-oblong, acute, dimidiate-cuneate at base, 16-35 mm. long, 6-16 mm. wide, coarsely crenate-serrate, ciliate, green above, paler beneath with fine white spots, petiole to 3 mm. long, stipules persistent, lanceolate, setiferous-acuminate, 4-6 mm. long, 3-5-nerved, membranaceous, brown; peduncles axillary, 1-2 cm. long, almost capillary; inflorescences 1-2-flowered; bracts persistent, ovate, like the stipules but shorter; pedicels subcapillary, 14-18 mm. long; flowers white; staminate tepals 4, the outer broadly ovate, acute, 7 mm. long, the inner oblong, obtuse, shorter; stamens short-connate, anthers linear, mostly longer than the filaments, connective produced, obtuse; pistillate bracteoles like the bracts, at the base of the ovary; pistillate tepals 5, 4-6 mm. long; styles 3, bifid, the stigmatic tissue linear, spiral, continuous; placentae simple; capsule ellipsoid, 10-12 mm. long excluding the wings, unequally 3-winged, all the wings triangular, acute or subacute, the largest 12-15 mm. wide.—Endemic, as to typical variety.—HBK. Nov.

Gen. & Sp. Pl. vii. 183, t. 642 (1825); Irmscher in Engl. & Prantl, Nat. Pflanzenfam. ed. 2, xxi. 581 (1925). *B. microphylla* Willd. ex Kl. in Monatsb. Berlin Akad. 123 (1854), nomen in synon. *Lepsia foliosa* Kl. Begon. 62 (1855). Tab. 16.

MAGDALENA: on a log, damp forest slope by a stream, Las Nubes, alt. 1350 m., Dec. 18, 1898, *H. H. Smith 1270* (NY, var.?, only staminate flowers).

NORTE DE SANTANDER: thickets, Cordillera Oriental, east slope, Pamplona, Quebrada de Cariongo, alt. 2500 m., July 26, 1940, *Cuatrecasas & H. García B. 10259* (G).

SANTANDER: wooded banks of Río de la Baja, below La Baja, Eastern Cordillera, alt. 2200-2300 m., Jan. 26, 1927, *Killip & A. C. Smith 18299* (G, NY, US); forest, vicinity of Charta, Eastern Cordillera, alt. 2000 m., Feb. 1-11, 1927, *Killip & A. C. Smith 19017* (US).

DEPARTMENT UNKNOWN: *Humboldt & Bonpland* (Paris, **type**; CM, frag.).

In this study we are maintaining five varieties of *Begonia foliosa* besides the typical. There is a certain amount of instability in the morphological characters, but the existing tendencies seem to be correlated with the geographical ranges of the entities and therefore, we consider segregation into varieties the most practical and logical way to deal with the mass of material here considered, in order to show the relationships as well as the distinctions between collections.

The typical variety is shown as illustrated in the original publication of the species. For the other varieties representative portions of characteristic material are illustrated. In the original diagnosis *B. foliosa* is described with a "5-phyllus" pistillate flower; in the plate, with the exception of fig. 1 which shows a flower with 5 tepals, all the other "pistillate" flowers, i. e. those surmounting the capsules, have 4 tepals and like the flower in fig. 1 have stamens but no styles! We assume that the plate was not drawn directly from nature.

Key to the Varieties of Begonia foliosa.

1. Inflorescence 1-2-flowered; peduncles capillary, mostly less than 0.5 mm. thick; anthers linear to oblong, filaments elongate.

   2. Wings of the capsule all acute or subacute; bracteoles borne at the base of the capsule ..... *B. foliosa* (typical).

   2. Wings of the capsule or at least the smaller ones rounded.

3. Bracteoles borne at the base of the capsule; capsule 8-10 mm. long excluding the wings; leaves acute ..... Var. *rotundata.*

3. Bracteoles borne below the base of the capsule.

Leaves broadly acute; capsule 6-11 mm. long excluding the wings ..... Var. *Putzeysiana.*
Leaves acuminate; capsule 6-8 mm. long excluding the wings ..... Var. *australis.*

1. Inflorescence usually more than 2-flowered; peduncles more than 0.5 mm. thick; anthers ellipsoid; filaments short.

Stipules imbricate in tufts on short shoots; leaves not more than 2 cm. wide; branches usually straight. ..... Var. *miniata.*
Stipules not imbricate in tufts; leaves more than 3 cm. wide; branches geniculate ..... Var. *amplifolia.*

Var. **rotundata** Smith & Schubert, var. nov., bracteolis femineis basem capsulae tegentibus; capsula alis exceptis 8-10 mm. longa, alis rotundatis. Tab. 17.

NORTE DE SANTANDER: thickets, Cordillera Oriental, eastern slope, Pamplona, Quebrada de Cariongo, alt. 2500 m., July 26, 1940, *Cuatrecasas & H. García B. 10249* (US).

SANTANDER: open hillside, vicinity of California, Eastern Cordillera, alt. 2100 m., Jan. 11-27, 1927, *Killip & A. C. Smith 16761* (G, **type**; NY, US, **isotype**); thicket along stream, vicinity of Charta, Eastern Cordillera, alt. 2000-2600 m., Feb. 1-11, 1927, *Killip & A. C. Smith 19221* (G, NY, US).

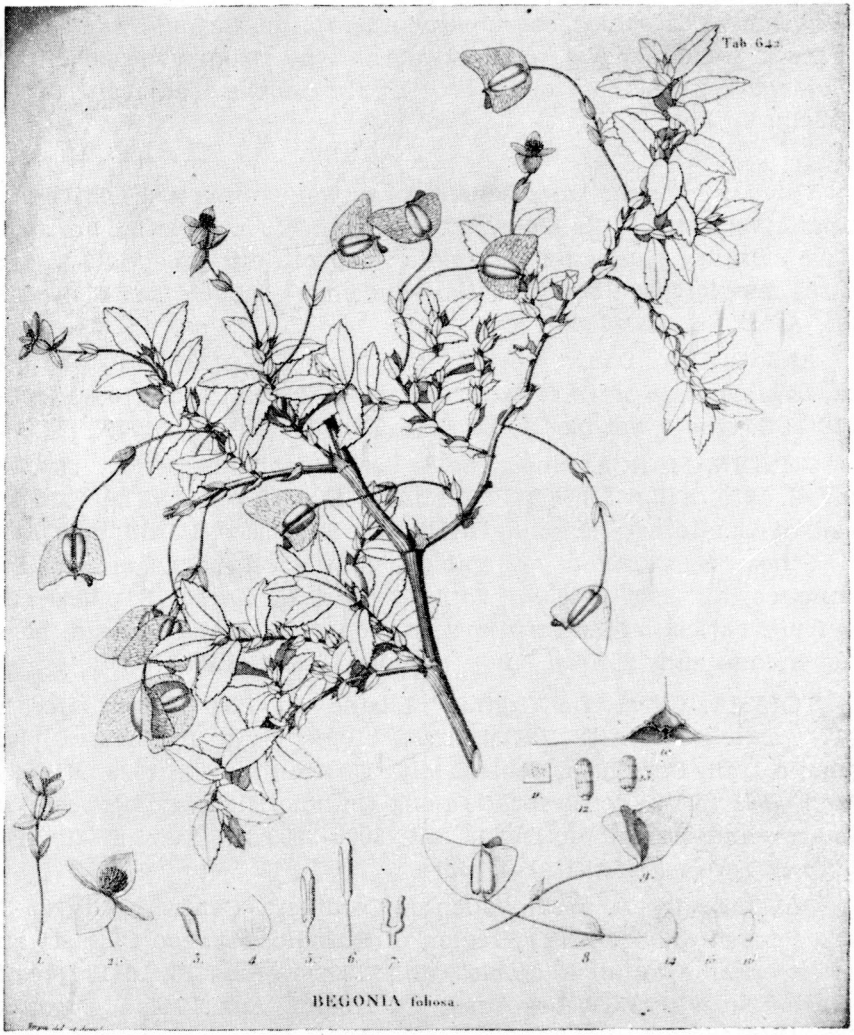
The following specimen is doubtfully referred here:

SANTANDER: woods, vicinity of California, alt. 2000 m., Jan. 11-27, 1927, *Killip & A. C. Smith 17015* (G, NY, US), staminate flowers only.

The chief differences between typical *Begonia foliosa* and its variety *rotundata* are in the capsules; the former with the largest wing ascending as well as acute, the latter with the largest wing horizontal and obtuse.

Var. **Putzeysiana** (A. DC.) Smith & Schubert comb. nov. Leaves broadly acute, 16-47 mm. long, 8-17 mm. wide; bracteoles attached below the base of the capsule; capsule 6-11 mm. long without the wings, wings rounded.—Venezuela.—*B. Putzeysiana* A. DC. in Ann. Sci. Nat. sér. 4, xi. 139 (1859). Tab. 17.

NORTE DE SANTANDER: thickets along stream, road from Pamplona to Toledo, crossing the divide between Río La Teja (Maracaibo



TAB. 16

drainage) and Río Mesme (Orinoco drainage), alt. 2500-2800 m., Feb. 28, 1927, *Killip & A. C. Smith 19817* (G, NY, US); woods, vicinity of Toledo, alt. 1700-1900 m., Mar. 3-11, 1927, *Killip & A. C. Smith 20090* (G, NY, US).

We have examined the type-photograph of *Begonia Putzeysiana* (CM neg. 24205) and a fragment of the type (from Venezuela). The Colombian material is found only in the province adjacent to Venezuela.

Var. **australis** Smith & Schubert, var. nov., foliis lanceolatis, acuminatis vel raro acutis, 20-40 mm. longis, 6-15 mm. latis; bracteolis e basi capsulae plus minusve remotis; capsulis alis exceptis 6-8 (raro ad 10) mm. longis, alis rotundatis.—Endemic.—? *B. elegans* HBK. Nov. Gen. & Sp. vii. 182 (1825). Tab. 17.

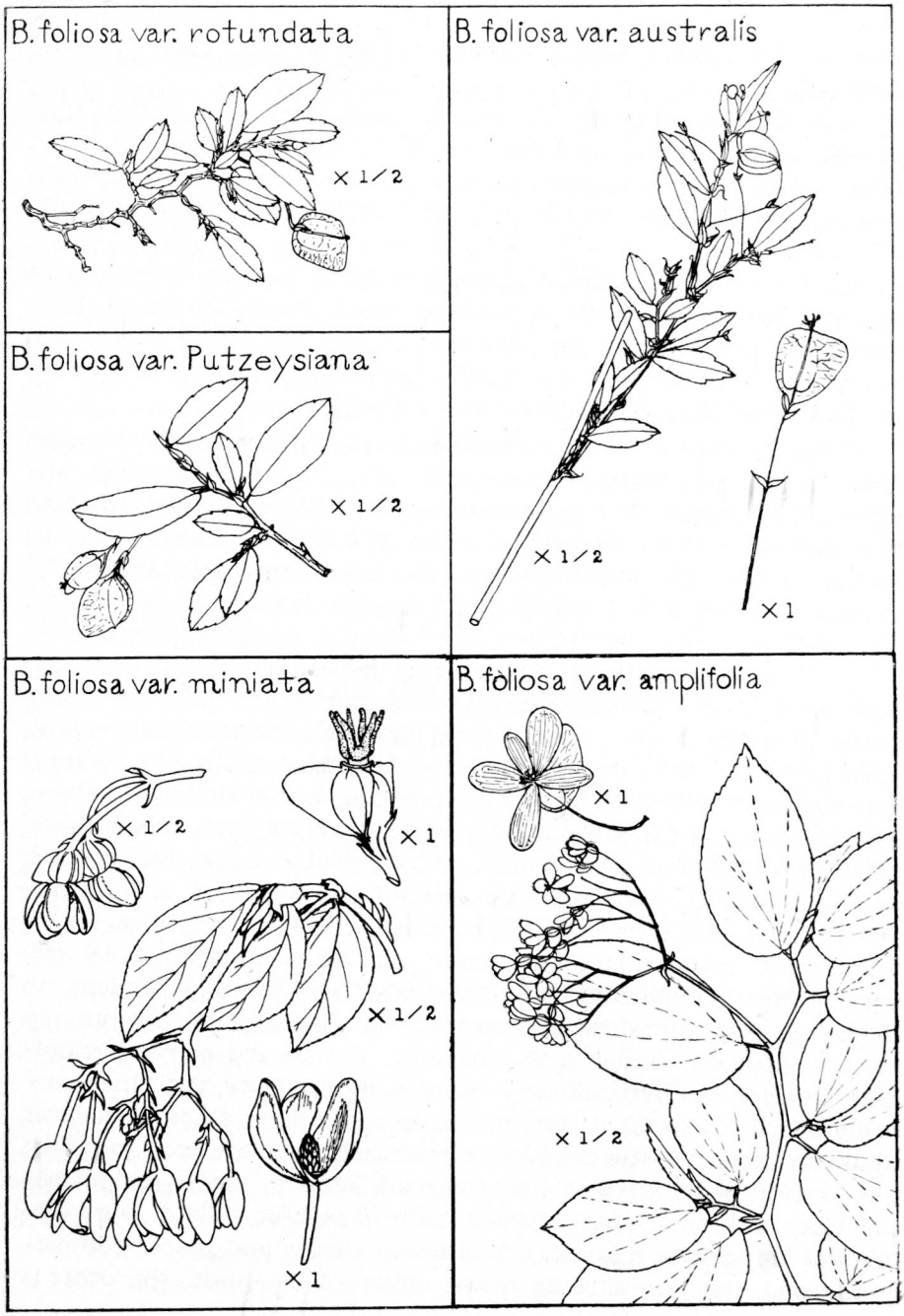
ANTIOQUIA: Dauro, April 6, 1928, *R. A. Toro 1135* (NY); La Sierra, 18 kilometers north of Medellín, alt. ca. 2000 m., Jan. 1931, *Archer 1516* (US, **type**); wet places, La Ceja, Dec. 1939, *Daniel 2159* (G, US).

CUNDINAMARCA: woods, Salto de Tequendama, alt. ca. 2500 m., Mar. 8, 1939, *Killip 33976* (G, staminate material placed here on the basis of leaf-form); climbing herb, San Francisco, Cordillera Oriental, Finca "El Carmero", El Tablazo between Subachoque and San Francisco, alt. 1900-2100 m., Jan. 26, 1944, *H. García B. 11026* (US, no fruit, variety not certain); west slope: Quebrada Sosiego, below Tequendama, alt. 2300 m., July 15, 1944, *Dugand 3558* (G).

TOLIMA: forest "La Virginia", Líbano, alt. 1200-1500 m., Dec. 22, 1917, *Pennell 3283* (NY, US); forest, "Buenavista" to "Azufral", old Quindío trail, Cordillera Central, alt. 2300 m., Aug. 3, 1922. *Killip & Hazen 9601* (NY); dense forest, along Quindío Highway, between Cajamarca and summit of Divide, alt. 3000-3100 m., Mar. 27-28, 1939, *Killip & Varela 34650* (US).

CALDAS: forest above Salento, Cordillera Central, July 25-31, 1922, *Pennell 8939* (G, NY); region of Quindío, between Circasia and Pereira, near Alto de "El Roble", alt. 2200 m., Aug. 16, 1941, *Dugand & Jaramillo 2987* (US); Los Alpes, alt. 2700 m., Aug. 1944, *E. Dryander 2780* (US).

VALLE: Juntas, Río Dagua, April 1, 1876, *André 2503* (NY); dense forest, San Antonio, west of Cali, near summit of Cordillera Occidental, alt. 1900-2350 m., Feb. 26-Mar. 2, 1939, *Killip & H. García B. 33938*


B. foliosa var. rotundata
× 1/2
B. foliosa var. australis
× 1/2
× 1
B. foliosa var. Putzeysiana
× 1/2
B. foliosa var. miniata
× 1/2
× 1
× 1/2
× 1
B. foliosa var. amplifolia
× 1
× 1/2

TAB. 17

(G); road to the sea, Alto Mercedes, alt. 2200 m., Sept. 1939, *Dryander 2413* (G).

CAUCA: Cuesta de Tocotá, road from Buenaventura to Cali, Cordillera Occidental, alt. 1500-1900 m., Dec., 1905, *H. Pittier 723* (US); moist bank, near stream, San Antonio to Río Ortega, Cordillera Occidental, alt. 2100-2200 m., July 2, 1922, *Pennell & Killip 8035* (G, NY, US).

This variety is somewhat difficult to define because of the degree of variation often found on a single plant. Some specimens have leaves broader at the apex (like var. *Putzeysiana*) and small capsules, while others have acuminate leaves and the bracteole close to the base of the capsule (as in var. *rotundata*).

Begonia elegans HBK. may belong here; a fragment of the type, from the Chicago Natural History Museum, consisting of twigs, stipule and acuminate leaf, agrees well enough with our variety, as does the description of the filiform peduncle, and the type-locality ("prope La Vega de San Lorenzo, inter Popayán et Almaguer, alt. 1140 hex."). Certain identification is not possible however, without fruit.

Var. **miniata** (Planch.) Smith & Schubert, comb. nov. Suffruticose, erect, 6-12 dm. high, glabrous, very variable in the size of the parts; stem stout, succulent; lateral branches numerous, divergent, densely foliate, 6-12 cm. long; leaves distichous, straight, slightly asymmetric, obovate-oblong or elliptic-oblong, acute, dimidiate at base, 2-5 cm. long, 1-2 cm. wide, crenate-serrate, ciliate, dark green above, paler beneath, often tinged with red especially along the margins, petiole usually about 2 mm. long, rarely up to 8 mm. (! A. DC.), stipules marcescent, lanceolate, setose-cuspidate, 4-10 mm. long, 1-nerved, entire, membranaceous, brown; peduncles axillary, 2-4.5 cm. long; cymes dichotomous, 2-30-flowered, flat, generally pendent, to 10 cm. in diameter; bracts persistent, like the stipules but usually roseate; pedicels slender, 5-25 mm. long; flowers red or rose; staminate tepals 4, the outer broadly ovate, 6-16 mm. long, the inner narrowly obovate, shorter; stamens numerous, anthers ellipsoid, shorter than the filaments, the connective produced; pistillate bracteoles like the bracts; pistillate tepals 5, subequal, elliptic, obtuse or setose-cuspidate, 6-13 mm. long; styles 3, bifid, placentae bifid ? (very difficult to see in dried material), ovuliferous throughout; capsule broadly ellipsoid, the largest wing ovate, obtuse, 1 cm. wide, the other 2

submarginiform, but slightly wider and angled above.—Venezuela; widely cultivated.—*B. miniata* Planch. in Fl. Serres, viii. 105, t. 787 (1853). *Tittelbachia miniata* Kl. Begon. 106 (1855). *B. fuchsioides* β *miniata* (Planch.) A. DC. in DC. Prod. xv. pt. 1, 291 (1864). *B. fuchsioides* Hook. in Bot. Mag. lxxiii. t. 4281 (1847). *Tittelbachia fuchsioides* Kl. loc. cit. et t. 10, fig. A. Tab. 17.

MAGDALENA: on ground or logs, Las Nubes, Santa Marta, alt. 1350 m., Dec. 15, 1898, *H. H. Smith 1269* (G, NY, US).

NORTE DE SANTANDER: edge of woods, between Mutiscua and Pamplona, alt. 2700 m., Feb. 23, 1927, *Killip & A. C. Smith 19763* (G, NY, US); thickets along stream, road from Pamplona to Toledo, crossing the divide between Río La Teja (Maracaibo drainage) and Río Mesme (Orinoco drainage), alt. 2500-2800 m., Feb. 28, 1927, *Killip & A. C. Smith 19819* (G, NY, US); edge of woods, eastern slope of Páramo del Hatico, en route from Toledo to Pamplona, alt. 1800 m., Mar. 12, 1927, *Killip & A. C. Smith 20552* (G, NY, US).

SANTANDER: thickets along river, vicinity of Suratá, alt. ca. 1700 m., Jan. 4-10, 1927, *Killip & A. C. Smith 16805* (G, NY, US).

CUNDINAMARCA: locality illegible, probably near Bogotá, alt. 2000 m., 1851-57, *Triana s. n.* (NY); Salto de Tequendama, Dec. 8-11, 1852, *Holton 724* (NY); Prov. de Bogotá: Monte de Tenasucá, alt. 2000 m., Jan. 1854, *Triana (2)* (Col); El Colegio, Feb. 1916. *Dawe 48* (US); Salto de Tequendama, alt. 2400 m., Sept. 15, 1917, *Pennell 1964* (NY); same, alt. 2400-2500 m., Oct. 28, 1917, *Pennell 2653* (G, Mo, NY, US); same, forest, alt. 2500 m., Dec. 1-3, 1938, *Cuatrecasas 102* (US); La Florida, Dec. 1932, *Pérez 2301* (US); Dintel (Facatativá-La Vega), alt. 2300-2700 m., June 4, 1939, *Pérez & Cuatrecasas 5300* (US); above Tequendama Falls (on Sabana) about 15 miles from Bogotá, Feb. 27, 1945, *Schiefer & Ewan 484* (G).

In the material cited above the stigmatic tissue is linear and spiral about the style-branches, not completely covering them as described in the type.

Although *B. fuchsioides* Hooker was described six years before *B. miniata* Planchon we are using *miniata* to designate this variety since it was the first epithet to be used in the varietal rank and as such has priority over earlier published specific epithets (cf. Int. Rules Bot. Nomencl. art. 55, p. 16 (1935)).

Variety *miniata* can be easily distinguished from var. *amplifolia*, the only other variety with a many-flowered inflorescence, by its non-

cordate, narrower leaves and fewer, not imbricated stipules, as well as its usually straight branches.

A. DeCandolle considered this plant not only a distinct species, *B. fuchsioides,* but placed it in a separate section. However, we have found his character of simple or bilamellate placentae very unreliable here and elsewhere, and Professor Roger Gauthier of the University of Montreal has kindly shown us further evidence from his morphological researches.

Var. **amplifolia** Smith & Schubert, var. nov., ramis geniculatis; foliis ultra 3 cm. latis, stipulis haud imbricatis; pedunculis ultra 0.5 mm. diametro; inflorescentiis submultifloris; antheris ellipsoideis, filamentis brevibus. Tab. 17.

ANTIOQUIA: Fredonia, April 14, 1927, *R. A. Toro 57* (NY, **type**; G, phot.).

This variety is outstanding because of its very broad leaves. The characters by which it may be distinguished from var. *miniata* are noted under that variety. In habit this variety approaches closely *Begonia Holtonis,* but its persistent stipules and elliptic anthers establish its affinity with *B. foliosa.*

Key to Colombian species of Begonia.

1. Plants scapose, tuberous or having a stout rhizome with suppressed internodes and the leaves and inflorescence clustered at its apex (base not known in *B. hydrophylloides*).

2. Staminate tepals 4-8, pistillate tepals 5-6; plants tuberous so far as known; leaves usually straight and subsymmetric, broadly ovate to suborbicular, never peltate.

3. Leaves acuminate-lobed; bracts deciduous; styles bifid. 1. *B. hydrophylloides.*

3. Leaves not lobed.

4. Tepals rose or white, 10-17 mm. long, staminate tepals 4-8; styles multifid (not known in *B. macra*).

5. Petioles much longer than the blades; tepals white, the staminate 5, pistillate 6. .....2. *B. quetamensis.*

5. Petioles about as long as the blades.

6. Tepals rose, the staminate 6, the pistillate 5. ..... 3. *B. macra.*

6. Tepals white, the staminate 7-8, the pistillate 6-7. ...4. *B. rosacea.*

4. Tepals yellow, 5-6 mm. long, staminate tepals only 4; styles bifid; placentae simple. ..... 5. *B. lutea.*

2. Staminate tepals 2, pistillate tepals 2 or rarely 3; rhizome with suppressed internodes; leaves peltate or oblique with their longest nerve at about 120° from the petiole; inflorescence obviously cymose; bracts deciduous.

7. Leaves basifixed.

8. Inflorescence, petioles and principal veins beneath the leaves fuscous-villous; leaves coarsely and sparsely dentate or entire; largest capsule-wing ovate. ..... 6. *B. Lindleyana.*

8. Inflorescence essentially glabrous; petioles covered with coarse reflexed scales; leaves denticulate; largest capsule-wing oblong or subdolabriform. ..... 7. *B. stigmosa.*

7. Leaves peltate. ..... 8. *B. nelumbiifolia.*

1. Plants with elongate leafy stems with distinct internodes.

9. Ovary and capsule turbinate, not winged but equally 3-horned from the upper part of the angles; stigmatic tissue usually covering all sides of the styles; capsule dehiscent at the angles; staminate tepals usually 4.

10. Capsule truncate without any column; horn of the capsule obtuse.

11. Horns flattened in a horizontal plane.

12. Leaves oblique; stipules deciduous. ..... 9. *B. trispathulata.*

12. Leaves straight; stipules persistent. ..... 10. *B. chlorolepis.*

11. Horn flattened in a vertical plane; stipules tardily deciduous. .... 11. *B. Trianae.*

10. Capsule with a definite (though sometimes short) column; horns of the capsule acute or acuminate.

13. Stipules green or red, firm, more or less persistent, oblong or subreniform, 12-25 mm. long.

14. Leaves straight, dimidiate at base; stipules red; inflorescence racemose; bracts persistent, showy, densely imbricate; anther-connective not produced. ..... 12. *B. Killipiana.*

14. Leaves oblique, cordate at base; stipules green; inflorescence cymose; bracts deciduous; anther-connective subulate-produced. ... . 13. *B. ferruginea.*

13. Stipules brown or hyaline, thin, usually soon deciduous, small and inconspicuous.

15. Basal bracts forming a more or less gamophyllous involucre about the inflorescence; staminate tepals 2, fleshy, entire; pistillate tepals 5, fimbriate. ..... 14. *B. gamolepis.*

15. Basal bracts not involucrate; staminate tepals 4.

16. Tepals lacerate-serrulate at apex, narrow; ultimate branches of the staminate inflorescence aborted making the flowers appear umbellate; pistillate inflorescence 1-flowered. ..... 15. *B. umbellata.*

16. Tepals entire or else very broad.

17. Leaves strongly oblique or transverse, cordate at base, never dimidiate.

18. Inflorescence many-flowered, to 2 dm. in diameter; column of the ovary or capsule very short but distinct. ..... 16. *B. cornuta.*

18. Inflorescence few-flowered; column of the ovary as long as the radius, exclusive of the horns. ..... 17. *B. toledana.*

17. Leaves nearly or quite straight, usually dimidiate at base.

19. Capsule-column much shorter than the capsule-radius.

20. Plant densely ferruginous-hirsute; the outer staminate tepals very thick, forming an ovoid nut-like husk around the stamens; pistillate tepals in 2 very distinct series ..... 18. *B. ursina.*

20. Plant sparsely and incompletely pubescent; staminate tepals thin; pistillate tepals subsimilar, not in distinct series.

21. Staminate tepals subequal; bracteoles elliptic. ..... 19. *B. grewiaefolia.*

21. Staminate tepals very unequal; bracteoles suborbicular. ..... 20. *B. colombiana.*

19. Capsule-column about equaling the capsule-radius.

22. Staminate tepals 12 mm. long; stamens on a 6 mm. long column; tepals red or rose in both sexes. ..... 21. *B. antioquensis.*

22. Staminate tepals not more than 8 mm. long; staminal column much shorter or lacking.

23. Staminate inflorescences usually many-flowered; outer staminate tepals apiculate; pistillate tepals showy, 9-14 mm. long; branches diffuse. ..... 22. *B. diffusa.*

23. Staminate inflorescences few-flowered; staminate tepals obtuse; pistillate tepals 3-5 mm. long; branches strict. ..... 23. *B. Urticae.*

9. Ovary and capsule ovoid, ellipsoid or globose (subturbinate in *B. ophiogyna*, but the wings very unequal), usually bearing 3 unequal wings; stigmatic tissue usually linear and spiral about the styles; capsule dehiscent beside the wings; staminate tepals 2 or 4.

24. Annuals with soft fibrous bases; leaves never peltate.

25. Wings extending the whole length of the ovary; pistillate bracteoles shorter than the ovary at anthesis.

26. Stamens free or on a short column, the connective more or less produced; placentae often simple and bilamellate in the same capsule.

27. Capsule-wings subequal, lunate; leaves mostly straight, glabrous or subglabrous. ..... 24. *B. semiovata.*

27. Capsule-wings very unequal, subdeltoid.

28. Leaves straight; plant glabrous except for a few scattered hairs on the leaves; staminate tepals 4, anther-connective much produced; pistillate tepals unequal; styles more than bifid. ..... 25. *B. subcostata.*

28. Leaves oblique or transverse; plant at least partially pubescent; staminate tepals usually 2, anther-connective only slightly produced; pistillate tepals subequal; styles not more than bifid.

29. Largest capsule-wing much wider than high; anthers globose; leaves narrowly elliptic-oblong, about 3 times as long as wide. ..... 26. *B. filipes.*

29. Largest capsule-wing about as high as wide; anthers ellipsoid; leaves ovate, mostly about twice as long as wide. ..... 27. *B. hirtella.*

26. Stamens on a definite column, the subglobose anthers emarginate; placentae bilamellate. ..... 28. *B. microcarpa.*

25. Wings along only the upper half of the ovary; pistillate bracteoles exceeding and concealing the ovary at anthesis. (42. *B. tiliaefolia*).

24. Perennials with firm bases.

30. Leaves distinctly oblique to transverse, never peltate.

31. Peduncles very short to absent; leaves only slightly oblique. .... (42. *B. tiliaefolia*).

31. Peduncles 1.5-14 cm. long.

32. Leaves entire or obscurely denticulate and very broadly cordate-ovate (their long axis less than twice their short one); stamens on a column, the subglobose anthers emarginate.... ..... 28. *B. microcarpa.*

32. Leaves either distinctly serrate or else at least twice as long as wide.

33. Leaves distinctly serrate or crenate.

34. Inner staminate tepals obcordate; styles multifid. .... 29. *B. ophiogyna.*

34. Inner staminate tepals obtuse or wanting.

35. Stipules broadly ovate, persistent; capsule-wings all narrow; bracts deciduous but bracteoles persistent, ample, concealing ovary. 30. *B. pastoensis.*

35. Stipules lance-oblong to elliptic, deciduous.

36. Bracts persistent; pistillate bracteoles ovate or narrower.

37. Bracts linear-lanceolate, entire; inflorescence many-flowered, 5-7 cm. in diameter. ..... 31. *B. sulcata.*

37. Bracts ovate, fimbriate; inflorescence few-flowered. ..... 32. *B. tovarensis.*

36. Bracts deciduous; pistillate bracteoles suborbicular. ..... 33. *B. magdalenae.*

33. Leaves partially and very obscurely denticulate.

38. Staminate tepals 4; styles multifid; capsule ellipsoid. ..... 34. *B. cryptocarpa.*

38. Staminate tepals 2; styles bifid; capsule ovoid, acute. ..... 35. *B. fagopyroides.*

30. Leaves nearly or quite straight or else peltate.

39. Leaves palmate- or peltate-nerved, usually symmetric or nearly so.

40. Plants large and stout; leaves 2-6 dm. wide; inflorescence of very many minute flowers. ..... 36. *B. parviflora.*

40. Plants slender; leaves much less than 2 dm. wide.

41. Stamens borne on a column; plants suffrutescent, scandent.

42. Inflorescence few-flowered, pubescent; tepals dentate; leaves cordate or short-peltate, dentate. .... 37. *B. Maurandiae.*

42. Inflorescence many-flowered; tepals entire; leaves denticulate to subentire, always peltate.

43. Cortex of even the ultimate branches pale gray, glabrous, friable; staminal column very short. ... . 38. *B. tropaeolifolia.*

43. Cortex dark red-brown, densely pubescent, not friable; staminal column equaling or slightly exceeding the tepals. ..... 39. *B. spadiciflora.*

41. Stamens free or only on a low torus.

44. Leaves peltate, 8 cm. long, 6 cm. wide, obtuse; styles multifid. ..... 40. *B. novo-granatae.*

44. Leaves basifixed.

45. Leaves obtuse, truncate at base, glabrous; stipules persistent, obtuse; capsule-wings attached the whole length of the capsule. .... 41. *B. cucullata.*

45. Leaves abruptly acuminate, cordate at base, partially pubescent; capsule-wings attached to the upper edge of the capsule. ..... 42. *B. tiliaefolia.*

39. Leaves pinnate-nerved, often strongly asymmetric at base.

46. Inflorescence laxly racemose, thyrsoid or paniculate with a central axis.

47. Pistillate tepals 4-5; pistillate bracteoles serrate; plant pubescent. ..... 43. *B. buddleiaefolia.*

47. Pistillate tepals 2; pistillate bracteoles obscurely undulate or entire, very ample, accrescent; plant essentially glabrous. .... 44. *B. Rossmanniae.*

46. Inflorescence cymose or very few-flowered.

48. Connective produced into a subulus longer than the anther; staminate tepals 2. ..... 45. *B. extensa.*

48. Connective only slightly produced.

49. Pistillate tepals 2-4.

50. Bracts persistent, bright red, showy; outer tepals ovate, acute. ..... 46. *B. Cuatrecasana.*

50. Bracts deciduous, inconspicuous.

51. Cymes laxly few-flowered; leaves lance-elliptic, only about 2 cm. wide; pistillate bracteoles broadly elliptic, serrulate. ..... 47. *B. xylopoda.*

51. Cymes many-flowered; leaves 3.5-8 cm. wide.

52. Staminate tepals 4; filaments equaling or exceeding anthers; pistillate bracteoles orbicular.

53. Peduncle glabrous; capsule-wings ciliate. .... 48. *B. cymbalifera.*

53. Peduncle hirsute; capsule-wings entire. .... 49. *B. Dugandiana.*

52. Staminate tepals 2; filaments shorter than anthers; pistillate bracteoles ovate. 50. *B. alnifolia.*

49. Pistillate tepals 5.

54. Leaves nearly symmetrical, broadly ovate; petioles 1-8 cm. long. ..... 51. *B. glabra.*

54. Leaves strongly asymmetric, at least at base.

55. Styles multifid; inflorescence many-flowered; stipules and bracts tardily deciduous; anthers oblong, mostly shorter than the filaments. ..... 52. *B. guaduensis.*

55. Styles only bifid.

56. Tepals serrate; inflorescence many-flowered; stipules and bracts persistent; anthers globose. ..... 53. *B. Barrigae.*

56. Tepals entire.

57. Stipules and bracts deciduous; inflorescence many-flowered. ..... 54. *B. Holtonis.*

57. Stipules and bracts persistent.

58. Leaves deeply and very asymmetrically cordate at base with one lobe much enlarged. ..... 55. *B. stenocardia.*

58. Leaves dimidiate at base, not over 2 cm. wide.

59. Ultimate branches densely papillose... ..... 56. *B. microphylla.*

59. Ultimate branches smooth. .... 57. *B. foliosa.*

EXCLUDED OR DOUBTFUL SPECIES:

BEGONIA OPULIFLORA Putz. in Fl. Serres, ser. 1, x. 71, t. 995 (1854-55). "Prov. Soto, ... Nouvelle Grenade" which is given as the type-locality is now Coclé in Panama.

BEGONIA ELEGANS HBK. Nov. Gen. & Sp. Pl. vii. 182 (1825). Described from imperfect material. Apparently equivalent to one of the varieties of *B. foliosa* HBK., but we cannot be certain without seeing the type.

BEGONIA MULTIFLORA Benth. Pl. Hartweg. 185 (1845). Type unavailable; identity doubtful.

2. **Begoniella** Oliver emend. Smith & Schubert

Caulescent, herbaceous to suffruticose. Leaves straight. Tepals usually connate for most of their length resulting in a 2- or 4-lobed

perianth in both staminate and pistillate flowers, often with a similar or undulate, shorter inner perianth also. Stamens 4-6, variously inserted. Fruit a horned capsule.—In Trans. Linn. Soc. xxviii. 513 (1873); emended by Oliver in Hook. Ic. xiv. 38 (1881).

Although our knowledge of Oliver's species is based only on his descriptions and illustrations together with a single collection of *B. Kalbreyeri* and our new species is described from but one ample specimen the specific lines in the genus *Begoniella* seem to be very distinct even though the relationships are unusually strong. More adequate collections are greatly desired. Additional material will do much to increase our understanding of the relationships between *Begonia* and *Begoniella*. The transition is obviously through *Begonia* § *Casparya* and specifically through *B. Killipiana* which rather strikingly resembles *Begoniella Whitei*.

Four species.—Endemic.

Key to Colombian species of Begoniella.

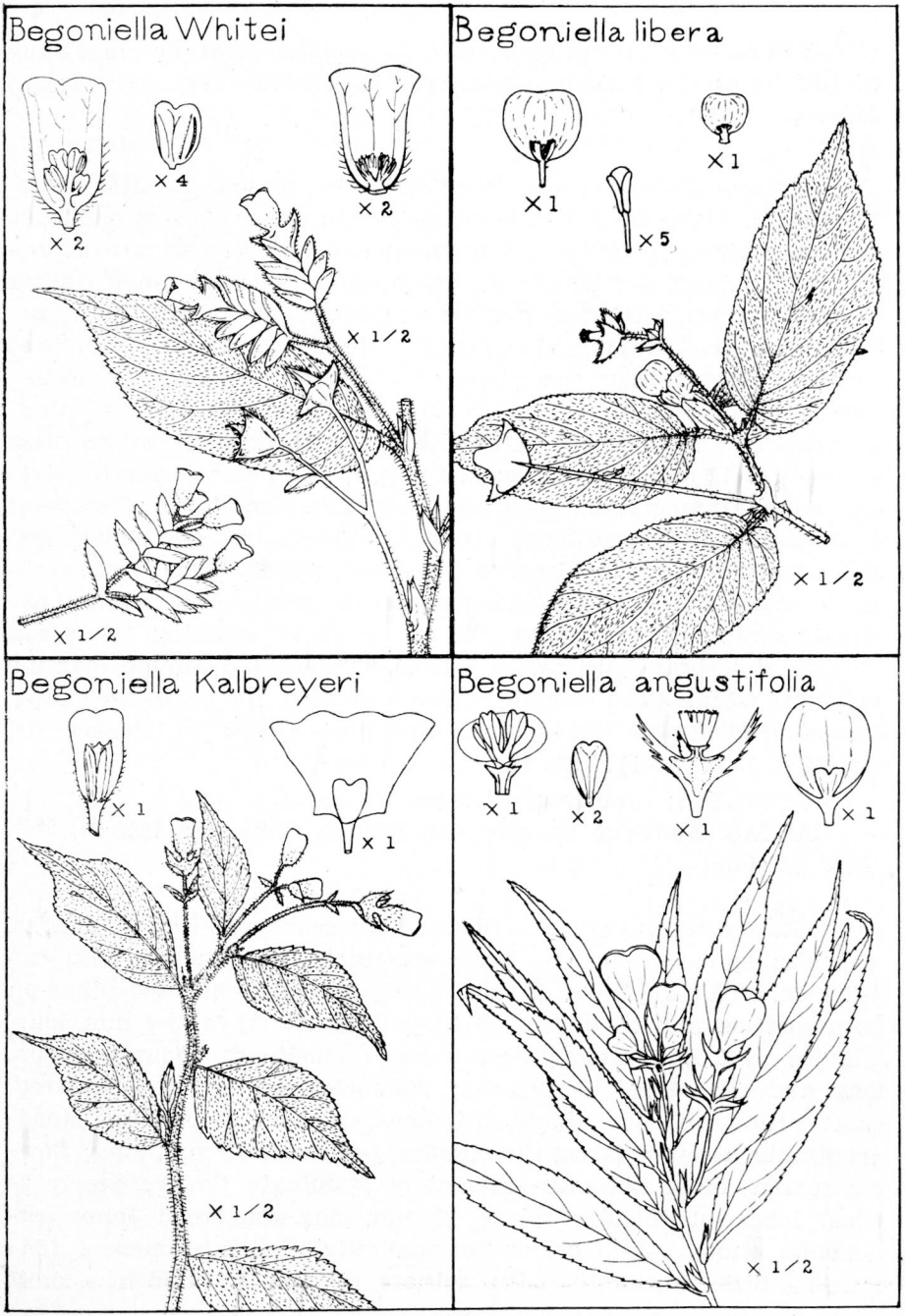
1. Leaves asymmetric, elliptic, dimidiate; ca. 2-3 times as long as broad.
   2. Inflorescence with many distichous imbricate bracts; perianth uniseriate. ..... 1. *B. Whitei.*
   2. Inflorescence with only a pair of bracts; perianth biseriate at least in the staminate flowers.
      Stamens six, anthers equal to the filaments in length, connective dilated, produced as a broad appendage beyond the loculi. ..... 2. *B. libera.*
      Stamens four, sessile or essentially so, slender, connective produced as a subulus beyond the loculi. ..... 3. *B. Kalbreyeri.*
1. Leaves symmetric, lance-acuminate, cuneate at base, ca. 6 times as long as broad. ..... 4. *B. angustifolia.*

1. **Begoniella Whitei** Oliver. Erect, herbaceous to suffruticose, 2.3-4.5 dm. high, stem papillose-setigerous; leaves straight, somewhat asymmetric, elliptic- to ovate-lanceolate, rather abruptly acuminate, the broader half of the base suborbicular, the narrower tapering to the petioles, 6-10 cm. long, 2.5-3.5 cm. broad, crenate-serrate, the teeth setiferous, appressed-pilose above, pubescent on the nerves beneath; petiole less than 1 cm. long, spreading-pubescent, stipules subpersistent, ovate-acuminate, 8-12 mm. long, entire; peduncle axillary, erect; inflorescence apparently racemose, many-flowered, simple or branched, shorter than to equaling the leaves; bracts erect to spreading,

densely imbricate, ovate-oblong, 10-15 mm. long, mucronate; pedicels delicate, spreading-pubescent, in the staminate flowers exceeding the bracts; staminate perianth 4-lobed, pilose toward the base without, 9 mm. high, each lobe ca. 7 mm. broad; stamens 4, distichous on a short column, anthers almost sessile, obovate, retuse; bracteoles of the pistillate flowers up to 1 cm. long, setiferous, persistent; pistillate perianth similar to staminate, styles almost fastigiate at base, much branched and the branches many times divided above; ovary 3-locular, placentae simple, multiovulate, capsule broadly turbinate, truncate at apex, equally 3-horned, the horns acuminate-ascending, spreading-pubescent particularly on the angles.—Endemic.—Oliver in Trans. Linn. Soc. xxviii. 513, t. 41 (1873). Tab. 18.

CHOCO: new path through forests of the Atrato valley ca. 30 miles east of Quibdó on the Atrato river, alt. 150 m., *R. B. White* (K, **type**, not seen).

2. **Begoniella libera** Smith & Schubert, spec. nov., herbacea caule viridi, infra purpureo, tenui, erecto, lineato, hispido; foliis rectis, paulo asymmetricis, oblongo-ellipticis, abrupte acuminatis, basi subrotundatis, basis latere ab axi decurrente, 7-10 cm. longis, 3-4 cm. latis, denticulatis, tuberculato-pilosis in nervo centrali et intra nervis lateralibus supra, in et intra nervis infra; petiolo brevissimo vel ad 11 mm. longo, dense hispido, stipulis persistentibus, oblongo-ellipticis, apice setiferis, obtusiusculis, 10-12 mm. longis, integris, hyalinis; pedunculis axillaribus, longe patenti-pilosis, inflorescentiis cymosis, paucifloris; bracteis stipulis similibus; pedicellis 5-10 mm. longis, patentipilosis; perianthio florum masculinorum de 2 seriebus, parte exteriori campanulato, 1 cm. alto, extus setifero, 4-lobato, lobis obtusis, parte interiori ca. 4 mm. alto, 4-lobato vel 2-lobato cum lobis sublaberis, retusis, staminibus 6, liberis, antheris 1 mm. longis, filamentis aequalibus, connectivo producto dilatatoque, obtuso; bracteolis femineis persistentibus, oblongo-ovatis, acuminatis, ciliato-setiferis, 6 mm. longis, 2 mm. latis; perianthio florum femineorum verisimiliter uniseriato, ca. 1 cm. alto, extus setifero, 4-lobato, lobis obtusis, stylis breviter et multo ramosis; ovario 3-loculato, placentis simplicibus, capsula turbinata, basi acuta, apice columna crasse cylindrica 12 mm. longa aucta, aequaliter 3-cornuta, cornubus acuminatis, adscendentibus. Tab. 18.


Begoniella Whitei
× 2
× 4
× 2
× 1/2
× 1/2
Begoniella libera
× 1
× 1
× 5
× 1/2
Begoniella Kalbreyeri
× 1
× 1
× 1/2
Begoniella angustifolia
× 1
× 2
× 1
× 1
× 1/2

TAB. 18

VALLE: west slope of the Cordillera Occidental, woods, right bank of Río Digua, La Elsa, alt. 1000-1200 m., Nov. 9, 1943, *Cuatrecasas 15320* (G, **type**).

3. **Begoniella Kalbreyeri** Oliver. Erect, herbaceous to suffruticose, 1.5-4.5 dm. high, stem papillose-hirsute; leaves a little asymmetric, ovate-acuminate, cuneate, the narrower half shorter and not extending so far down the petiole as the broader, 5-7.5 cm. long, rather coarsely serrate, setiferous, papillate-pubescent above and below; petioles very short, stipules linear-lanceolate, a little longer; peduncles axillary, shorter than the leaves, 1-4-flowered; bracts few, ovate-oblong to lanceolate, 4-7 mm. long; pedicels delicate, spreading-pubescent, to 7 mm. long; outer perianth 4-lobed, pilose toward base without, 10-12 mm. long, lobes ca. 4 mm. broad, inner perianth short-campanulate, membranaceous, about equaling the stamens; stamens 4, slender, slightly broadened above, essentially free but almost sessile, connective produced beyond the loculi; pistillate bracteoles similar to bracts but a little broader, setiferous, persistent; pistillate perianth similar to staminate, the inner about equaling the much divided style-branches; ovary 3-locular, placentae simple, capsule turbinate with a short column, equally 3-horned, the horns ascending, spreading-pubescent throughout.—Endemic.—Oliver in Hooker, Ic. xiv. 38, t. 1352 (1881). Tab. 18.

ANTIOQUIA: *Kalbreyer* (K, **type**, not seen).

CALDAS: Andes del Quindío, Sta. Rosa de Cabal, alt. 1600 m., Feb. 1852, *J. Triana (23)* (Col; G, phot.).

4. **Begoniella angustifolia** Oliver. Herbaceous, stem erect, slender, glabrate; leaves symmetric, lance-acuminate, ca. 6-15 cm. long and 1-2.5 cm. broad, duplicate-serrate, mostly sparsely appressed-pilose on both surfaces and on midrib above, petioles short, ca. 2-4 mm. long, stipules persistent membranaceous, lance-acuminate, about 4-10 mm. long and exceeding the petioles; peduncles axillary, few-flowered, shorter than the leaves, bracts distichous, spreading imbricated, lance-acuminate, about equaling the stipules, pedicels 7-15 mm. long; flowers scarlet, outer perianth-segment of staminate flowers deeply 2-lobed, lobes suborbicular, retuse, 15 mm. long and broad, inner segment ca. 4 mm. long, more or less shallowly 4-lobed, stamens 4, filaments a little shorter than the anthers, apparently fused in a short

column at the base, anthers obovate, emarginate; pistillate perianth single, about equaling the staminate, styles more or less connate below, unequally multifid, ovary apparently glabrous with presumably simple placentae, capsule turbinate, 3-celled with a short column at apex, equally 3-horned, horns ascending and lacerate.—Endemic.—Oliver in Hook. Ic. xv. 68, t. 1487 (1885). Tab. 18.

CHOCO: Nóvita, *R. B. White* (K, **type**, not seen).

Begoniella angustifolia is similar to *B. Whitei* in having distichous (though less numerous and slenderer) bracts and in the number and form of its stamens (although their insertion is different). It is similar to *B. Kalbreyeri* and to our *B. libera* in having the perianth double in the staminate flowers and agrees with *B. libera* also in having ony a single perianth in the pistillate flowers.